Table of Contents

Table of Contents
(Continued)

Section **Page**

Table of Contents
(Continued)

Section **Page**

Table of Contents
(Continued)

Table of Contents
(Continued)

Section **Page**

List of Figures

List of Figures
(Continued)

List of Figures
(Continued)

46-1.03(04) Drainage

The profile and transitions at each intersection should be evaluated for impacts on drainage. This may require spot elevations to be shown for an intersection which may have exceptional drainage problems (e.g., an intersection which occurs in a sag vertical curve).

46-1.04 Capacity and Level of Service

The Production Management Division's Office of Environmental Services, in general, will perform a capacity analysis of the intersection during the preparation of the Engineer's Report. This analysis will influence several geometric design features including the number of approach lanes, lane widths, channelization, and number of departure lanes. These determinations will be based on a selected level of service and design year traffic (i.e., 20 years into the future). Level of service criteria are shown in the geometric design tables in Chapters Fifty-three through Fifty-six. Once the level of service and design traffic volumes are determined, the detailed capacity analysis is performed using the *Highway Capacity Manual* and the criteria presented in Chapter Forty-one.

46-1.05 Types of Intersections

46-1.05(01) Number of Legs

An at-grade intersection is usually a 3-leg ("T" or "Y" shape), 4-leg, or multi-leg design. An individual intersection may vary in size and shape and may be non-channelized, flared, or channelized. The principal factors which affect the selection of intersection type and its design characteristics are the DHV, turning movements, traffic character or composition, design speed, intersection angle, topography, desired type of operations, and safety.

A multi-leg intersection is that with five or more intersection legs, and should be avoided wherever practical. Where volumes are light and stop control is used, it may be satisfactory to have all intersection legs intersect at a common, all-paved area. At other than a minor intersection, safety and efficiency are improved by rearrangement that removes some conflicting movements from the major intersection. This may be accomplished by realigning one or more of the intersecting legs and combining some of the traffic movements at adjacent subsidiary intersections or, sometimes making one or more legs one-way away from the intersection.

45-1.05(02) Types of Public Road Approaches

The warrants for each type of public road approach are as follows:

1. Public Road Approach Type A. This approach should be used where the mainline shoulder is unpaved, or, if paved, is less than 2.4 m in paved width.

2. Public Road Approach Type B. This approach should be used where the mainline shoulder is paved, and is 2.4 m or wider in paved width. A paved shoulder of this width or greater will encourage use by a right-turning vehicle to clear the mainline traffic lane when decelerating for the turn.

Public road approach types A and B are designed to accommodate design vehicles WB-15 or smaller with right-hand turns beginning and ending in the traffic lanes. Right-turn lanes are not provided for these approaches. Either of these approaches should be used for a public road serving a residential, light-commercial, or light-industrial area.

3. Public Road Approach Type C. This approach should be used where the mainline shoulder is paved, is 2.4 m or wider in paved width, and an auxiliary right-turn lane along the mainline is warranted due to the right-turning traffic volume. This approach is designed to accommodate design vehicles WB-15 or smaller without encroaching onto the adjoining traffic lane. It will also accommodate a WB-20 design vehicle if a portion of the adjoining traffic lane is utilized. This approach should be used for a public road serving a residential, light-commercial, or light-industrial area.

4. Public Road Approach Type D. This approach should be used where the mainline shoulder is paved, is 2.4 m or wider in paved width, and an auxiliary right-turn lane along the mainline is warranted due to the right-turning traffic volume. This approach is designed to accommodate design vehicles WB-20 or smaller. This approach should be used where two Department-maintained routes intersect, or for a public road serving a commercial area, heavy-industrial area, or truck stop.

Figure 46-1C(1), Public Road Approach Types and Corresponding Design Vehicles, summarizes each type of public road approach and the corresponding appropriate design vehicles it can accommodate.

Public Road Approach	Appropriate Design Vehicle
Type A ● Paved or unpaved shoulder width < 2.4 m. ● Approach radius starts from edge of travel lane. ● Right-turn lane along mainline is not warranted. ● Serves residential, light-commercial, or light-industrial area.	WB-15 or smaller
Type B ● Paved shoulder width ≥ 2.4 m. ● Approach radius starts from edge of shoulder. ● Right-turn lane along mainline is not warranted. ● Serves residential, light-commercial, or light-industrial area.	WB-15 or smaller
Type C ● Paved shoulder width ≥ 2.4 m. ● Approach radius starts from edge of shoulder. ● Auxiliary right-turn lane along mainline is warranted. ● Serves residential, light-commercial, or light-industrial area.	WB-15 or smaller WB-20 if adjoining traffic lanes are utilized.
Type D ● Paved shoulder width ≥ 2.4 m. ● Approach radius starts from edge of shoulder. ● Auxiliary right-turn lane along mainline is warranted. ● Used at intersection of two Department-maintained routes. ● Serves commercial area, heavy-industrial area, or truck stop.	WB-20 or smaller

Note: If one of these standard public road approach types cannot be used at a particular intersection site, the public road approach should be designed and the intersection details should be shown on the plans.

PUBLIC ROAD APPROACH TYPES
AND CORRESPONDING DESIGN VEHICLES

Figure 46-1C(1)

46-1.05(03) Determining Pavement Sections

If for a public road approach type A, B, or C, the ADT is 1000 or less, or for a public road approach type D, the ADTT of FHWA Class 5 trucks is 50 or less, the minimum pavement section shown on the INDOT *Standard Drawings* should be specified.

If for a public road approach type A, B, or C, the ADT is greater than 1000, or for a public road approach type D, the ADTT of FHWA Class 5 trucks is greater than 50, ESALs must be determined as described in *Indiana Design Manual* Section 52-8.03(01).

For an HMA approach, the required mix type is determined based on ESALs as shown in *Indiana Design Manual* Figure 52-9B. The courses and densities should be those identified in the minimum pavement section shown on the INDOT *Standard Drawings.*

For a PCCP approach, the pavement thickness is determined as described in *Indiana Design Manual* Section 52-8.03(03).

46-1.06 Intersection Spacing

When creating a new intersection, the designer must ensure that there is sufficient distance between the new and adjacent intersections so that they form distinct intersections. Short distances between intersections should be avoided, if practical, because they tend to impede traffic operations. For example, if two intersections are close together and require signalization, they may need to be considered as one intersection for signalization purposes. To operate safely, each leg of the intersection may require a separate green cycle, thereby greatly reducing the capacity for both intersections. To operate efficiently, signalized intersections should desirably be 400 m apart. In general, all new intersections should preferably be at least 120 m apart.

In addition, short gaps between opposing "T" intersections should be avoided. Drivers tend to encroach into the opposing lanes (corner cutting) so that they can turn in one movement.

46-1.07 Design Vehicles

46-1.07(01) Types

The basic design vehicles used for intersection design are as follows:

1.	P	Passenger car, light panel truck, or pickup truck
2.	SU	Single-unit truck
3.	CITY-BUS	City transit bus
4.	S-BUS-11	Conventional school bus (65 passengers)
5.	A-BUS	Articulated bus
6.	WB-12	Intermediate semitrailer combination
7.	WB-15	Intermediate semitrailer combination
8.	WB-19	Interstate semitrailer combination
9.	WB-20	(Indiana Design Vehicle) Interstate semitrailer combination
10.	WB-30T	Semitrailer combination with three trailers
11.	WB-33D	Turnpike semitrailer combination with two trailers
12.	MH	Recreational vehicle: motor home
13.	P/T	Recreational vehicle: passenger car and camper trailer
14.	P/B	Recreational vehicle: passenger car and boat trailer
15.	MH/B	Recreational vehicle: motor home and boat trailer

See Figure 46-1D, Typical Semitrailer Combination Design Vehicle illustrates a typical turning path of a semitrailer design vehicle. Section 46-12.0 provides turning templates for the design vehicles which are typically used by the Department.

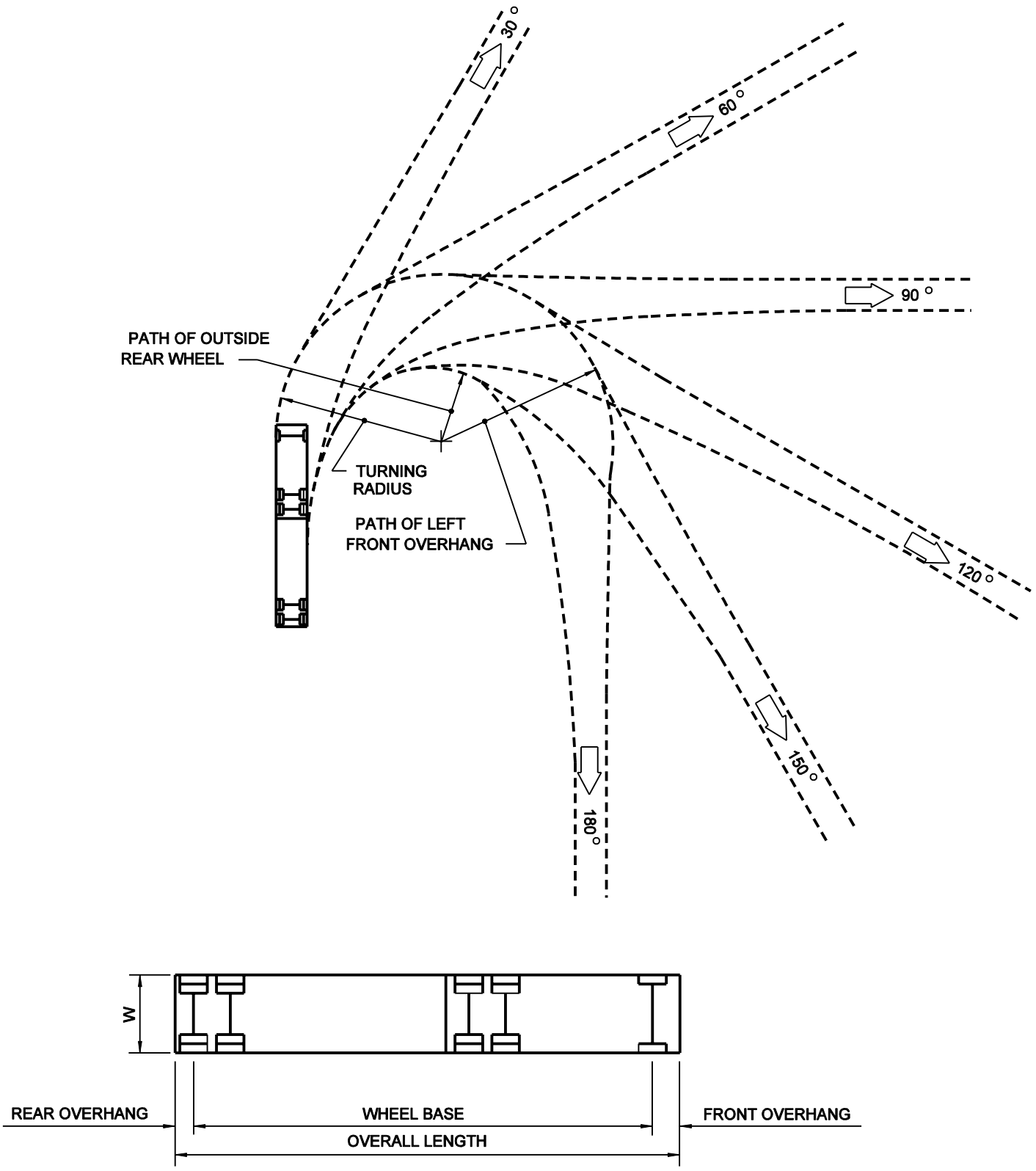
46-1.07(02) Selection

In general, the selected design vehicle should be based on the largest vehicle that will use the intersection with some frequency. Figure 46-1E, Suggested Design Vehicle Selection (Intersection), identifies the desirable and minimum design vehicles based on the functional classification of the intersecting highways which the vehicle is turning from and onto.

Some portions of an intersection may be designed with one design vehicle and other portions with another vehicle. For example, it may be desirable to design physical characteristics such as curbs or islands for the IDV but to provide painted channelization markings for a passenger car. This will provide a positive indicator for the more-frequent-turning vehicle.

The SU vehicle is generally the smallest vehicle used in the design of an intersection. This reflects that, even in a residential area, delivery trucks will be negotiating turns with some frequency. On a facility accommodating regular truck traffic, one of the semitrailer combinations should be used for design. For design purposes, it can be assumed the IDV (WB-20) is permitted to operate on all public highways.

The WB-30T and WB-33D design vehicles are only permitted to operate on the Indiana Toll Road or within 25 km of its toll gates.



TYPICAL SEMITRAILER COMBINATION DESIGN VEHICLE

Figure 46-1D

For Turn Made From	For Turn Made Onto	Suggested Design Vehicle	
		Desirable	Minimum
Freeway Ramp	Other Facilities	IDV	WB-19
Other Facility	Freeway Ramp	IDV	WB-19
Arterial	Arterial Collector Local	IDV IDV IDV	WB-19 WB-15 WB-15
Collector	Arterial Collector Local	IDV IDV WB-15	WB-15 WB-15 WB-12
Local	Arterial Collector Local	IDV WB-15 SU*	WB-15 WB-12 SU

* *WB-15 can physically make the turn.*

SUGGESTED DESIGN VEHICLE SELECTION
(Intersection)

Figure 46-1E

**[Figure 46-4G
Deleted]**

the full-width length will often only be sufficient for storage.

The length of an auxiliary lane will be determined by some combination of its taper length, L_T, deceleration length, L_D, and storage length, L_S, and by the mainline functional classification. Figure 46-4H, Functional Lengths of Auxiliary Turning Lanes, provides the length considerations for the various classifications. See Figure 46-4 I, Typical Auxiliary Lanes at an Intersection. The following will apply.

1. Taper. For tangent approaches, the Department's practice is to use a 30-m straight-line taper at the beginning of a single turn lane, or a 45-m straight-line taper at the beginning of dual turn lanes for an urban street. On a curvilinear alignment, the entrance taper should typically be designed with a constant rate of divergence throughout the curve. The entrance taper length should be at least 15 m.

2. Deceleration. For a rural facility, the deceleration distance, L_D, should meet the criteria shown in Figure 46-4J, Deceleration Distances for Turning Lanes. In addition, the values determined from Figure 46-4J should be adjusted for grades. Figure 46-4J also provides these grade adjustment factors. These distances are desirable on an urban facility; however, this is not always feasible. Under restricted urban conditions, deceleration may have to be accomplished entirely within the travel lane. For this situation, the length of turn lane will be determined solely on the basis of providing adequate vehicle storage, i.e., $L_D = 0$ m.

3. Storage Length (Signalized Intersection). The storage length, L_S, for a turn lane should be sufficient to store the number of vehicles likely to accumulate in a signal cycle during the design hour. The following should be considered in determining the recommended storage length for a signalized intersection.

    a. The storage length should be based on the cycle length and the traffic volumes during the design hour. For a cycle of less than 120 s, the storage length should be based on 2 times the average number of vehicles that would store during the cycle during the design hour. For a cycle of 120 s or longer, the storage length should be based on 1.5 times the average number of vehicles that would store during the cycle during the design hour. Average vehicle length is assumed to be 6.1 m. At a minimum, space should be provided for two passenger cars.

Classification	Functional Length
Rural Arterial	$L_T + L_D + L_S$
Urban Arterial Other Facility Stop or "T" Facility	$L_T + L_D + L_S$ (Desirable) $L_T + L_S$ (Minimum)

L_T = Length of Taper (30 m or more)
L_D = Length of Deceleration
L_S = Length of Storage

Notes:

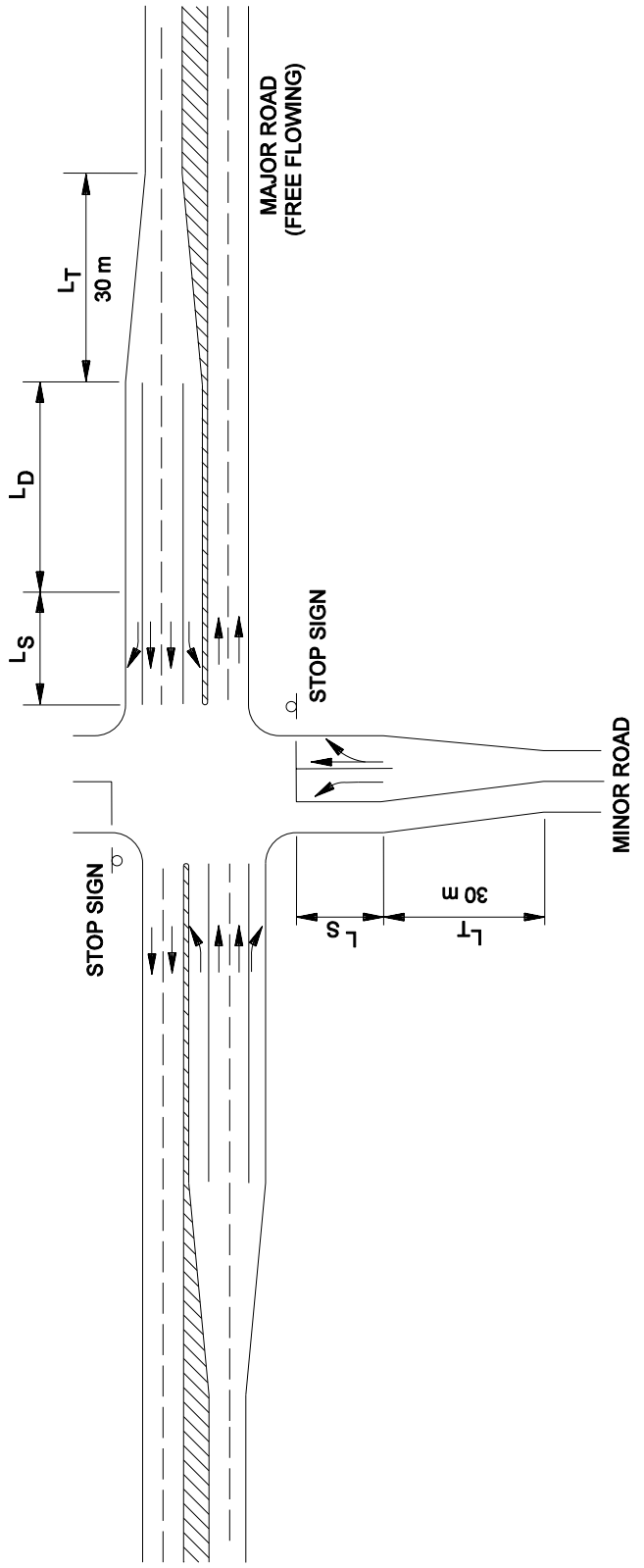
1. *See Figure 46-4 I for an illustration of the terms.*

2. *L_D is only a consideration at free-flowing legs of a stop-controlled intersection, signalized intersection, or free-flowing turning roadway with turn lanes.*

FUNCTIONAL LENGTHS OF AUXILIARY TURNING LANES

Figure 46-4H

b. Figure 46-4K(1), Recommended Storage Length for Signalized Intersection, illustrates an alternative method to determine the recommended storage length for a left-turn lane, or a right-turn lane where a turn on red is prohibited, for a signalized intersection for which the *v/c* ratio is known. The values obtained from the figure are for a cycle length of 75 s and a *v/c* ratio of 0.80. For other values, the length obtained in the figure should be multiplied by the appropriate adjustment factor shown in Figure 46-4K, Storage Length Adjustment Factors. The *v/c* ratio is determined by a capacity analysis as described in the *Highway Capacity Manual*.



Note: The schematic of the major road (free flowing) also applies to all legs of a signalized intersection.

Key: L_T = Taper length (30 m or more)
L_D = Deceleration length
L_S = Storage length

TYPICAL AUXILIARY LANES AT AN INTERSECTION

Figure 46-4 I

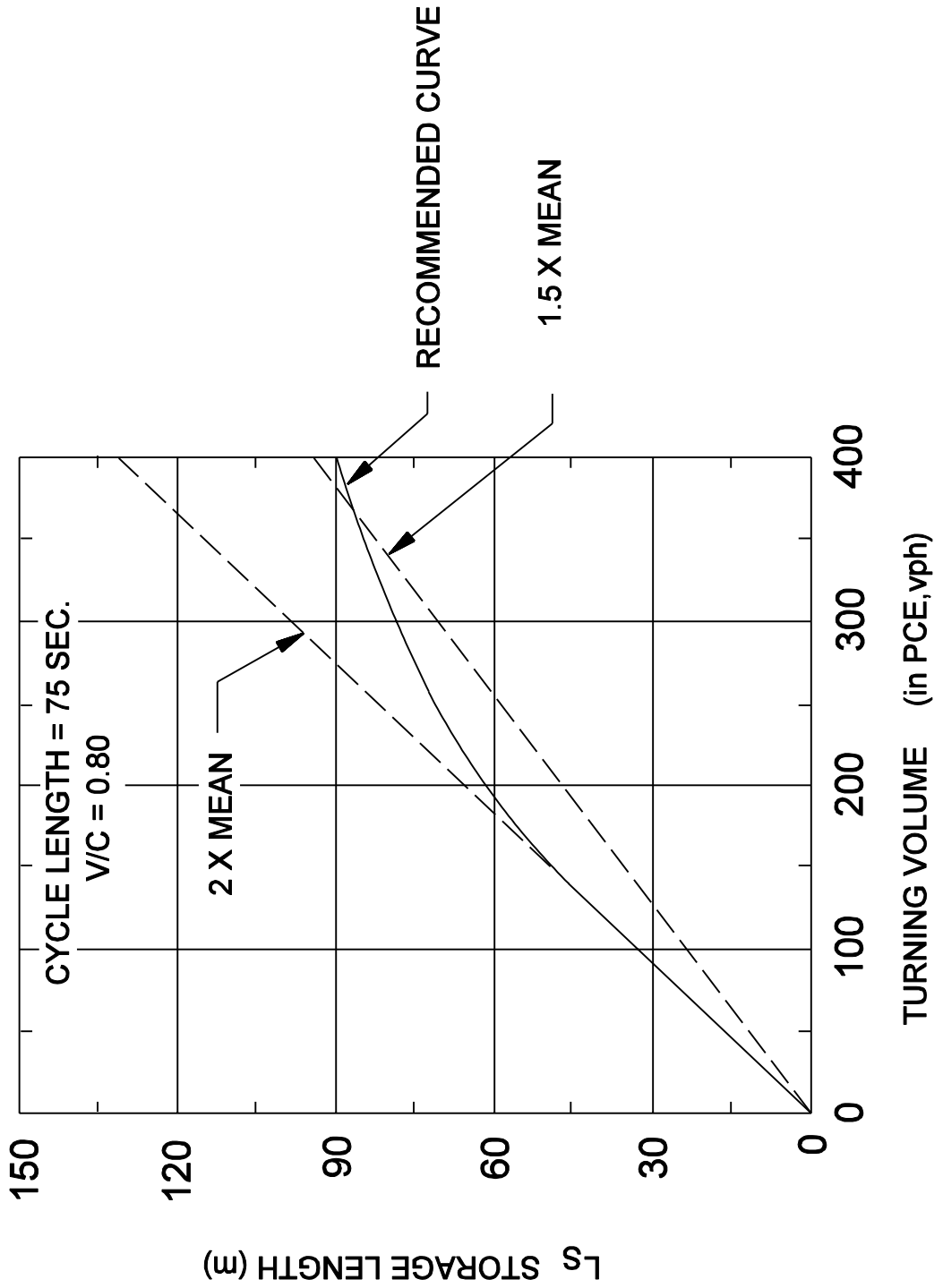
Design Speed (km/h)	Desirable L_D Full-Width Auxiliary Lane (m)
110	285
100	245
90	205
80	165
70	130
60	100
50	70
40	60

Grade Adjustment Factors (1)			
Downgrade			
6.00% to 5.00%	4.99% to 4.00%	3.99% to 3.00%	2.99% to 0%
1.35	1.28	1.20	1.00
Upgrade			
0% to 2.99%	3.00% to 3.99%	4.00% to 4.99%	5.00% to 6.00%
1.00	0.90	0.85	0.80

(1) *Ratio from this table multiplied by the length provided above will give the deceleration lane length adjusted for grade. Adjustment factors apply to all design speeds.*

DECELERATION DISTANCES FOR TURNING LANES

Figure 46-4J



RECOMENDED STORAGE LENGTH FOR SIGNALIZED INTERSECTIONS

Figure 46-4K

v/c RATIO, *X*	CYCLE LENGTH, *C* (s)				
	60	70	80	90	100
0.50	0.70	0.76	0.84	0.89	0.94
0.55	0.71	0.77	0.85	0.90	0.95
0.60	0.73	0.79	0.87	0.92	0.97
0.65	0.75	0.81	0.89	0.94	1.00
0.70	0.77	0.84	0.92	0.98	1.03
0.75	0.82	0.88	0.98	1.03	1.09
0.80	0.88	0.95	1.05	1.11	1.17
0.85	0.99	1.06	1.18	1.24	1.31
0.90	1.17	1.26	1.40	1.48	1.56
0.95	1.61	1.74	1.92	2.03	2.14

Notes: 1. *Table applies to an exclusive left-turn lane or an exclusive right-turn lane where a turn on red is not permitted.*

2. *See minimum storage length discussion in Section 46-4.02(02).*

3. *To determine the v/c ratio and the passenger car equivalent (PCE) values, see the Highway Capacity Manual*.

RECOMMENDED STORAGE LENGTH FOR SIGNALIZED INTERSECTION

Figure 46-4K(1)

c. Where a turn on red is permitted or where a separate right-turn signal phase is provided, the length of the right-turn lane may be reduced due to less accumulation of turning vehicles.

4. Storage Length (Unsignalized Intersection). The storage length should be sufficient to avoid the possibility of a left-turning vehicle stopping in the through lanes and waiting for a gap in the opposing traffic flow. The minimum storage length should have sufficient length to accommodate the expected number of turning vehicles likely to arrive in an average 2-minute period within the design hour. At a minimum, space should be provided for two passenger cars. If truck traffic exceeds 10%, space should be provided for at least one passenger car and one truck. See Figure 46-4L, Recommended Storage Lengths (L_S) for Unsignalized Intersection.

5. Minimum Turn-Lane Length. Under restricted conditions, the minimum full-width right- or left-turn lane length, including deceleration and storage, may be 15 m where there are less than 10% trucks, or 30 m where there are 10% or more trucks. This is exclusive of the taper. See Item 1 for minimum taper length.

   At a signalized intersection, the right- or left-turn lane length should exceed the storage length of the adjacent through lane. Otherwise, a vehicular queue in the through lane will block entry into the turn lane for turning vehicles.

46-4.02(03) Channelized Left-Turn Lane

If a left-turn lane is required on a 2-lane highway, it should desirably be designed as a channelized left-turn lane as illustrated in Figure 46-4M, Channelized Left-Turn Lane for 2-Lane Highway. As an alternative, based on site conditions and turning volumes, a passing blister may be used at a T intersection. See Section 46-4.03.

46-4.02(04) Slotted Left-Turn Lane

On 4-lane facilities with wide divided medians, slotted left-turn lanes are desirable where the median width is equal to or greater than 7.3 m. The advantages are as follows:

1. better visability of opposing through traffic;

2. decreased possibility of conflict between opposing left-turning vehicles; and

3. more left-turning vehicles are served.

TURNING DHV (vph)	L_S (m)
≤ 60	15 - 25
60 < vph ≤ 120	30
120 < vph ≤ 180	45
> 180	60 or greater

Note: See Section 46-4.02(02) for minimum storage length criteria.

RECOMMENDED STORAGE LENGTH (L_S) FOR UNSIGNALIZED INTERSECTION

Figure 46-4L

Figure 46-4N, Typical Slotted Tapered Left-Turn Lane (Signalized Intersection), and Figure 46-$4N_1$, Typical Slotted Parallel Left-Turn Lane (Signalized Intersection), illustrate typical tapered and parallel slotted left-turn lanes. In addition, the designer should consider the following:

1. Slotted Length. The slotted section of the turn lane should be at least 15 m long with a desirable minimum of 30 m. The slotted section should not include any of the required deceleration distance for the turn lane.

2. Nose Width. The nose of the slotted lane should be a minimum of 1.2 m plus any shoulder/curb offset width (and/or return taper) from the opposing through lanes. The nose position should be checked for interference with the turn paths from the cross street.

46-11.0 DRIVEWAY DESIGN

46-11.01. General Information

46-11.01(01) Definitions of Drives and Types

The definitions of types and classes of drives are as follows:

1. Residential. A residential drive provides access to a single family residence, duplex, or apartment building with not more than four dwelling units. A residential drive along a roadway with a raised curb is a class I drive. A residential drive along a roadway with a paved or unpaved shoulder and no raised curb is a class II drive.

2. Commercial. A commercial drive provides access to an office, retail, or institutional building, or to an apartment building with five or more dwelling units. A drive which serves an industrial plant, but with a primary function to serve an administrators' or employees' parking lot, is considered to be a commercial drive. A commercial drive along a roadway with a raised curb is a class III drive. A commercial drive along a roadway with a paved or unpaved shoulder and no raised curb is a class IV drive.

3. Industrial. An industrial drive directly serves substantial numbers of truck movements to and from loading docks of an industrial facility, warehouse, or truck terminal. A centralized retail development, such as a community or regional shopping center, may have one or more drives especially so designed, signed, and located to provide access for trucks. This is also classified as an industrial drive. An industrial drive may be designed either as a public road approach or as an industrial drive. An industrial drive along a roadway with a raised curb is a class VII drive. An industrial drive along a roadway with a paved or unpaved shoulder and no raised curb is a class VI drive.

4. Field Entrance. A field entrance provides access to an unimproved property, e.g., a farm field with no buildings. Such a drive along a roadway with a paved or unpaved shoulder is a class V drive.

46-11.01(02) Drive Spacing and Corner Clearances

Closely-spaced drives can cause operational problems, especially with a high-volume roadway and/or high-volume drives. These problems can also result if a drive is too close to an at-grade intersection.

Desirably, any part of a drive, including its entrance radius, should not be placed within the radius of a public road at an intersection, including any auxiliary lanes. Preferably, there should be a 6- to 12-m tangent section between the drive radius and the public road radius for greater separation. If this criterion cannot be met for a property at an intersection corner, one solution may be to relocate the drive entrance from the major road to the minor road, if practical. Another possible solution is to provide a right-turn lane at the intersection. This will improve the operation of the intersection by removing the turning vehicles for the drive and intersection out of the through travel lane(s). However, significant numbers of turning vehicles may impair egress from the property.

Drives for the same owner should be located across from each other (e.g., a farm) where crossing traffic is significant or where it is not desirable to permit slow or large equipment to travel along the highway or shoulder.

46-11.01(03) Drive Sight Distance

Section 46-10.0 discusses intersection sight distance (ISD) criteria for an intersection with a public road. Desirably, these criteria will also apply to sight distance at a drive. However, for a drives with low traffic volume, it is not warranted to explore extraordinary measures to improve sight distance. Sight obstructions, e.g., large trees, hedgerows, etc., should be checked for in the vicinity of the drive entrance which may limit sight distance. To perform the check, it is reasonable to assume an eye location of approximately 3 m from the edge of travel lane.

If drive sight-distance criteria with the eye location described above cannot be met, informal notification should be provided to the project reviewer for a consultant-designed project or to the supervisor for an in-house project.

46-11.01(04) Auxiliary Lanes

Deceleration and acceleration lanes should be considered at each high-volume drive entrance, especially on a high-speed, high-volume arterial. Sections 46-4.0 and 46-7.0 further discuss the design and warrants for these auxiliary lanes, which may also apply to a high-volume drive. In addition to traffic-volume considerations, it may be warranted to provide a right-turn lane into the drive if the change in grade is abrupt at the drive entrance.

46-11.01(05) Joint Residential or Commercial Drive

If practical and agreeable to the property owners, the use of a joint drive offers one option to reduce the number of access points along the highway. The centerline of the joint drive should be located on the property line dividing the two owners. This practice will not allow either owner the opportunity to deny or restrict access to the neighbor's property and, depending on the traffic volume, may improve the traffic flow on the mainline. For a commercial drive, this may require providing a drive wide enough to handle two-way traffic.

46-11.02 Design Criteria

The INDOT *Standard Drawings* provide the Department's design criteria for the various drive classes. In addition, the following should be considered.

46-11.02(01) Class Determination Considerations

1. If it is determined from the survey or at the field inspection that a field entrance serves a barn or storage shed for farm machinery, it should be designed as a class II drive with a 7.2-m minimum width instead of a class V drive.

2. Where there are positive indications that a private residence is being used for commercial purposes, the drive should be designed as a commercial drive.

46-11.02(02) Radii

1. Class II and class IV drive radii should start from the edge of the paved shoulder if the width of the paved shoulder is 2.4 m or greater.

2. Class II and class IV drive radii should start from the edge of the traveled way if the width of the paved shoulder is less than 2.4 m.

3. Class VI drive tapers should start from the edge of the traveled way without regard to the shoulder's width or whether or not the shoulder is paved.

46-11.02(03) Width

1. Drive width should be measured perpendicular to the centerline of the drive.

2. For each new drive constructed where no drive currently exists, the minimum width shown on the INDOT *Standard Drawings* should be used, unless determined otherwise at the field inspection or if the Land Acquisition Division recommends a wider width.

3. The width of a reconstructed drive should be the same as the existing width but not less than the minimum width nor greater than the maximum width shown on the INDOT *Standard Drawings.*

4. Each drive that serves a barn or storage shed for farm equipment should be a minimum of 7.2 m in width.

46-11.02(04) Drive Grades

For a class I, III, VI, or VII drive, the maximum algebraic difference in drive grades should not exceed 8% for a crest vertical curve, or 12% for a sag vertical curve. For a class II, IV, or V drive, the maximum algebraic difference in drive grades should not exceed 11% for a crest vertical curve, or 14% for a sag vertical curve.

If it is known that large emergency vehicles or other large vehicles will be using a drive, or if the algebraic differences exceed those noted above, the fit of the drive grade should be checked against the vehicle templates.

Drive grades should be shown and drive PVIs should be identified on the cross-sections sheets.

46-11.02(05) Grading

The drive's embankment slope within the mainline clear zone should be as shown in Figure 46-11A, Drive Embankment Slopes Within Clear Zone. Outside the clear zone, the embankment slope should desirably be 4:1, but should not be steeper than 3:1.

Slope	Multi-lane Divided Highway	Other Arterial	Collector	Local Road
10:1	All	All	Design Speed ≥ 80 km/h	n/a
6:1	n/a	All	Design Speed ≥ 80 km/h	n/a
4:1	n/a	n/a	Design Speed < 80 km/h	All

DRIVE EMBANKMENT SLOPES WITHIN CLEAR ZONE

Figure 46-11A

46-11.02(06) Paving

1. Each residential, commercial, or industrial drive should have either an asphalt or concrete surface as shown on the INDOT *Standard Drawings* from the edge of the mainline pavement to at least the highway right-of-way line. The drive pavement should be replaced in kind beyond the right-of-way line only if required to match grade or alignment, and not to repair the drive due to condition.

2. A field entrance typically has an unimproved soil surface within the right-of-way, except as discussed in Section 46-11.02(01) Item 1.

46-11.02(07) Intersecting Sidewalk Treatment

1. Sidewalk curb ramps should only be used with a signalized class III or class VII drive.

2. For a class I drive or nonsignalized class III or class VII drive, a sidewalk elevation transition as shown on the INDOT *Standard Drawings* should be used.

46-11.03 Impacts to Project with Drive Designs Complete and Right of Way Acquisition Under Way

Each Class I or III drive should have its grade designed in accordance with the INDOT *Standard Drawings*. However, if the profile-grade requirements shown in such *Standard Drawings* extend an already-designed drive outside the available right of way, such drive should have its grade detailed on the plans so that the drive remains inside the available right of way. Such drive should also be checked for accessibility by large emergency vehicles or other large vehicles. Such drive should be identified as modified.